

The following conclusions have been inferred by me from the above observations :

1. The form of the cells which compose a conductive tissue can have no importance in directing the pollen tube, though they may deflect it here and there in its course. This is clear from the circumstance that we have in two of the species studied, a conductive tissue, the cells of which are elongated at *right angles to the path* of the tube. We must therefore conclude that the guidance of the pollen tube through the tissue is due to a chemotactic stimulus, thus confirming the view of Molisch and with which Longo finds agreement. In order, however, to determine *direction*, the stimulant must, I have maintained, be distributed differentially, from a center toward which, therefore, the pollen tube must grow. I now believe that the egg cell is the origin of this substance.

2. The behavior of the pollen tube, whether ectotropic or endotropic, is a purely physiological character. When the mechanical conditions make it necessary, as, *e. g.*, in *Cucurbita Pepo*, and as I have shown in *Diodia teres*, the path of the pollen tube is wholly endotropic; when, however, there is a free space to move in, this may be used by the pollen tube, or if the distribution of the chemotactic stimulant is otherwise, the free space may be avoided. By inference, the phylogenetic interpretation of endotropism advanced by Treub and Nawaschin is of no further importance.

For other facts and conclusions, less relevant to our present purpose, the reader may be referred to the original papers. It is of no small interest that almost precisely parallel facts have been brought to light independently by two different observers, and that, equally independently, the same significance has been attached to these facts.

#### SHORTER NOTES

EVENING PRIMROSES. — The evening primroses (*Onagra* or *Oenothera*) are the center of an unusual interest at the present time because of the new species which have been seen to arise

from *O. Lamarckiana* by Professor de Vries. The undersigned wishes to secure preserved specimens and ripe seeds of any form with large flowers, growing wild or in cultivation, east of the Mississippi river. Any information or coöperation which will enable me to secure this material for experimental purposes will be gratefully received.

D. T. MACDOUGAL.

NEW YORK BOTANICAL GARDEN.



TERATOLOGY OF SEEDLING BEAN. — The seedling lima-bean figured is remarkable in that it possesses three cotyledons with a dextral phyllotaxy, the unpaired one being the lowest. All are of the usual size and apparently perfectly functional. The hypocotyl is of the usual length and thickness. The first node is swollen and bears three equally developed and functional leaves with coalesced petioles which form a tube slit down one side, from which the growing point protudes at a right angle to the stem. The seedling shows the same relative proportions as normal seedlings planted at the same time; each leaf is just as large, and if anything the whole plant is more vigorous than usual. Abnormalities often offer morphological or phylogenetic hints

of value, the most obvious one in this case being that botanists in all probability have been attaching too much importance to the number of cotyledons. Three cotyledons have been previously recorded in this genus according to Coulter (1903) and Braun in his *Pflanzenmissbildungen* (1869) mentions numerous other dicotyledons which occasionally possess three cotyledons.

EDWARD W. BERRY.

PASSAIC, NEW JERSEY.

*Scirpus Coloradoensis* sp. nov. — Annual, uliginous, similar to *Scirpus nanus*; culms tufted, filiform, 4 cm. high or less. Spikelet solitary, ebracteate, linear-oblong, acutish, 3–5 mm. long, about 2 mm. thick: scales lanceolate, acutish, the keel green, bordered by two brown bands, the margins scarious: stamens apparently two: bristles none: achene brown, obovate, 1 mm. long, trigonous, narrowed at the base, the apex scarred by the base of the deciduous style, the surface finely papillose, the papillae arranged in irregular transverse lines.

Shore Lake, Larimer County, Colorado, *J. H. Cowen*, July 21, 1896.

This species differs from *S. nanus* in the darker scales, the absence of bristles, and the darker colored papillose achene, the achene of *S. nanus* being finely longitudinally lined.

N. L. BRITTON.

## PROCEEDINGS OF THE CLUB

APRIL 12, 1904

The meeting was held at the New York College of Pharmacy, with Dr. MacDougal in the chair. The name of Miss A. Irva Lee Kuter, 1264 Lexington Avenue, New York City, was presented by the nominating committee and she was elected to active membership in the Club.

The first paper of the evening was by Professor L. M. Underwood on "*Cyathea* and its allies in Jamaica." One of the objects of Professor Underwood's trip to Jamaica last year was to study the tree ferns in the field. Specimens usually show a single pinna without its connections or any part of the caudex. Such material has been used for types and one species has been described from a single pinnule. Although a species which is well known can often be recognized by a fragment of a good specimen, it should show as much as possible of a pinna, its connection with the main rachis, and part of the caudex.

The Cyatheaceae or tree ferns mostly have an elongated caudex or trunk but a few are herbaceous. The more distinctive family characters are furnished by the sporangia, which are rounded-triangular with complete ring and are sessile or very